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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/034,075	01/03/2002	Tomoharu Kajiyama	HIRA.0021	2462

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EXAMINER	
FORMAN, BETTY J	

ART UNIT	PAPER NUMBER
1634	

DATE MAILED: 05/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/034,075	KAJIYAMA ET AL.	
	Examiner	Art Unit	
	BJ Forman	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 24 February 2004 has been entered.

Status of the Claims

2. This action is in response to papers filed 24 February 2004 in which claim 1 was amended and claims 5-12 were added. All of the amendments have been thoroughly reviewed and entered.

The previous rejections in the Office Action dated 24 October 2003, not reiterated below, are withdrawn in view of the amendments. All of the arguments have been thoroughly reviewed and are discussed as they apply to the instant grounds for rejection. New grounds for rejection are discussed.

Claims 1-12 are under prosecution.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-3 and 5-7 are rejected under 35 U.S.C. 102(e) as being anticipated by Lund et al U.S. Patent No. 6,106,784, filed 26 September 1997).

Regarding Claim 1, Lund et al disclose an apparatus comprising a first membrane, a plurality of islands provided on a first side of the membrane and probe cells provided on a side opposite the first side of the membrane, wherein the islands are spaced from each other with intervals filled with air (Fig. 12 and Column 4, lines 50-54) and each of the islands includes a temperature controller for controlling heat and temperature of each probe cell independently (Column 3, lines 9-42).

Regarding Claims 2-3, Lund et al disclose the apparatus wherein the intervals between islands is 100μm or longer (Column 3, lines 10-13).

Regarding Claim 5, Lund et al disclose an apparatus comprising a first membrane, a plurality of islands provided on a first side of the membrane and probe cells provided on a side opposite the first side of the membrane, wherein the islands are spaced from each other with intervals (Fig. 1-12 and Column 4, lines 50-54) and each of the islands includes a temperature controller for controlling heat and temperature of each probe cell independently (Column 3, lines 9-42).

Regarding Claims 6-7, Lund et al disclose the apparatus wherein the intervals between islands is 100μm or longer (Column 3, lines 10-13).

5. Claims 1-3 and 5-7 are rejected under 35 U.S.C. 102(e) as being anticipated by Astle (U.S. Patent No. 6,632,653, filed 13 December 1999).

Regarding Claim 1, Astle discloses an apparatus comprising a first membrane (substrate web/carrier tape), a plurality of islands provided on a first side of the membrane (thermal transfer station #240, Fig. 2-4 a portion of which lies below the membrane) and probe cells (one pattern, Fig. 1 #40 and Column 3, lines 28-33) provided on a side opposite the first side of the membrane, wherein the islands are spaced from each other with intervals filled with air (Fig. 2 illustrates the plurality of islands spaced along the membrane) and each of the islands includes a temperature controller for controlling heat and temperature of each probe cell independently (Column 5, lines 45-58).

Regarding Claims 2-3, Astle discloses the apparatus wherein the intervals between islands is 100μm or longer (Fig. 2).

Regarding Claim 5, Astle discloses an apparatus comprising a first membrane (substrate web/carrier tape), a plurality of islands provided on a first side of the membrane (thermal transfer station #240, Fig. 2-4 a portion of which lies below the membrane) and probe cells (one pattern, Fig. 1 #40 and Column 3, lines 28-33) provided on a side opposite the first side of the membrane, wherein the islands are spaced from each other with intervals (Fig. 2 illustrates the plurality of islands spaced along the membrane) and each of the islands includes a temperature controller for controlling heat and temperature of each probe cell independently (Column 5, lines 45-58).

Regarding Claims 6-7, Astle discloses the apparatus wherein the intervals between islands is 100μm or longer (Fig. 2).

6. Claim 5 is rejected under 35 U.S.C. 102(e) as being anticipated by Yasuda et al (U.S. Patent No. 6,093,370, filed 10 June 1999) as defined by Giancoli, D.C. (Physics: Principles with Applications, 3rd., Prentice Hall, NJ, 1991, pages 379-382).

Regarding Claim 5, Yasuda et al disclose a biochemical reaction detection apparatus comprising a first membrane, a plurality of island on one side of the membrane and probe cells for immobilizing probes said probe cells being provided on an opposite side of the membrane wherein the islands are spaced from each other with intervals (Fig. 11) and each of the islands is provided with a temperature controller for heating and temperature control of the probe cells (Column 11, lines 43-62) wherein the heating and temperature of the probe cells are controlled independently (Column 11, lines 54-62 and Column 13, lines 5-24). Yasuda et al further teach the islands are spaced from each other (Column 11, lines 43-62).

7. Claim 8 is rejected under 35 U.S.C. 102(e) as being anticipated by Yasuda et al (U.S. Patent No. 6,093,370, filed 10 June 1999) as defined by Giancoli, D.C. (Physics: Principles with Applications, 3rd., Prentice Hall, NJ, 1991, pages 379-382) and Handbook of Chemistry and Physics, The Chemical Rubber Publishing Co., Cleveland, Ohio, 1963, pages 2527-2531).

Regarding Claim 8, Yasuda et al disclose a biochemical reaction detection apparatus comprising a first membrane, a plurality of island on one side of the membrane and probe cells for immobilizing probes said probe cells being provided on the other (opposite) side of the membrane wherein the islands are spaced from each other with intervals and each of the islands is provided with a temperature controller for heating and temperature control of the

probe cells (Column 11, lines 43-62) wherein the membrane is thermally insulating (Column 11, lines 44-46) e.g. glass (Column 13, lines 35-57).

Yasuda et al do not specifically teach the heat conductivity of the membrane. However, the Handbook of Chemistry and Physics provides the thermal conductivity of glass as being between 0.001-0.0025 calories/second · centimeter (depending on the type of glass). Converting calories/second · centimeter to w/mk (1 calorie/second · centimeter =418.5 w/mk) the glass substrate of Yasuda et al has a conductivity of between 1.0 and 0.4 w/mk which is less than 10w/mk as instantly claimed.

Response to Arguments

8. Applicant argues that the substrate of Yasuda et al cannot insulate heat horizontally; cannot block heat transmission between adjacent islands; and cannot accurately control temperature of each probe layer. The arguments have been considered but are not found persuasive because the instant claims are drawn to islands, spaced from each other with intervals wherein the islands include a temperature controller for controlling heat and temperature of probe cells independently. Yasuda et al teach an apparatus comprising these elements (Fig. 11 and Column 11, lines 43-62). The claims do not recite structural components for horizontal insulation or heat transmission between adjacent islands. Applicant's arguments regarding "accurately controlled" temperature is not found persuasive because is not found persuasive for three reasons. First, Yasuda et al teach individual control of the probe regions (Column 11, lines 53-62). Second, "accurate" is a relative term. Temperature control of any device would be considered "accurate" compared to some other device. Therefore, the apparatus of Yasuda would accurately control the temperature relative to the control of some other device. Finally, the argument addresses functionality of the apparatus and not the structural components of the apparatus.

The courts have stated that claims drawn to an apparatus must be distinguished from the prior art in terms of structure rather than function see *In re Danly*, 263 F.2d 844, 847, 120

USPQ 528, 531 (CCPA1959). "[A]pparatus claims cover what a device is, not what a device does." Hewlett-Packard Co. v. Bausch & Lomb Inc., 909 F.2d 1464, 1469, 15 USPQ2d 1525,1528 (Fed. Cir. 1990) (see MPEP, 2114).

Applicant further argues that the office has improperly combined the glass substrate of Yasuda's embodiment III with the substrate of Yasuda's embodiment II. The argument has been considered but is not found persuasive because Yasuda continuously and consistently defines their substrate as "substrate 1" (e.g. Column 4, lines 54-57; Column 5, lines 5-10; Column 11, lines 44-47; and Column 13, lines 35-38). Yasuda provides a definition of the composition of "substrate 1" as glass (Column 13, lines 35-38). As such, Yasuda defines "substrate 1" as glass.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 6-7 and 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yasuda et al (U.S. Patent No. 6,093,370, filed 10 June 1999) as defined by Giancoli, D.C. (Physics: Principles with Applications, 3rd., Prentice Hall, NJ, 1991, pages 379-382) in view of Sosnowski et al (U.S. Patent No. 6,051,380, filed 5 December 1997).

Regarding Claims 6 and 7, Yasuda et al disclose a biochemical reaction detection apparatus comprising a first membrane, a plurality of island on one side of the membrane and

probe cells for immobilizing probes said probe cells being provided on an opposite side of the membrane wherein the islands are spaced from each other with intervals filled with heat insulating material (as defined by Giancoli and discussed above) and each of the islands is provided with a temperature controller for heating and temperature control of the probe cells (Column 11, lines 43-62) but they are silent regarding the length of intervals between the islands. However, intervals of longer than 50μ m (Claim 2) and longer than 100μ m (Claim 3) were well known in the art at the time the claimed invention was made as taught by Sosnowski et al (Column 23, lines 16-23 and 52-54). Sosnowski et al teach a similar biochemical detection apparatus comprising a first membrane, a plurality of island on one side of the membrane and probe cells for immobilizing probes said probe cells being provided on the other (opposite) side of the membrane wherein the islands are spaced from each other with intervals (Column 21, lines 36-Column 22, line 30) wherein due to the complexity of underlying circuitry, the interval (spacing) between islands is determined based on the number of islands i.e. as the number of islands increase, the spacing increases proportionally (Column 23, lines 16-23) wherein a support having 64 microlocations has intervals of 50μ m (Column 23, lines 46-54). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the island intervals of Sosnowski et al to the apparatus of Yasuda et al and to design their apparatus to have intervals of 100μ m or longer based on the teaching of Sosnowski et al wherein the as the number of islands increase, the spacing increases proportionally (Column 23, lines 16-23). Therefore, one of ordinary skill in the art would have been motivated to provide intervals of 100μ m or longer based on a desired number of island being greater than 128 as suggested by the teaching of Sosnowski et al wherein 50μ m intervals are required for 64 islands and intervals increase proportionally with the number of islands based on the complexity of required circuitry (Sosnowski et al, Column 23, lines 16-23 and 52-54).

Regarding Claim 9-12, Sosnowski et al teach the similar device wherein the membrane comprises a metal (e.g. silicon nitride, silicon oxide or aluminum oxide) and has a thickness of less than 5μm (Column 24, lines 23-67) wherein the silicon component provide "important properties" for the device e.g. better contact and improved sealing with circuitry and is less relative with reagents used on the surface (Column 24, line 65-Column 25, line 7).

It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the silicon components taught by Sosnowski et al to the substrate of Yasuda et al for the expected benefits of better contact and improved sealing with circuitry and is less relative with reagents used on the surface which Sosnowski et al defines as important properties (Column 24, line 65-Column 25, line 7).

It would have been further obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the substrate of Yasuda et al to provide a membrane substrate of less than 5μm thick based on a well known thickness taught by Sosnowski et al (e.g. Column 24, lines 23-40) because one would have had a reasonable expectation of success to do so.

It is noted that *In re Aller*, 220 F.2d 454,456, 105 USPQ 233,235 states where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum by routine experimentation. Hence, it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify/adjust the membrane thickness of Yasuda, using routine experimentation, to obtain the instantly claimed thickness for the expected benefit of optimizing function of the device.

Furthermore, the courts have stated that "where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device." *In Gardner v. TEC*

Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984).

11. Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Astle (U.S. Patent No. 6,632,653, filed 13 December 1999) in view of Sosnowski et al (U.S. Patent No. 6,051,380, filed 5 December 1997).

Regarding Claims 9-12, Astle discloses an apparatus comprising a first membrane (substrate web/carrier tape), a plurality of islands provided on a first side of the membrane (thermal transfer station #240, Fig. 2-4 a portion of which lies below the membrane) and probe cells (one pattern, Fig. 1 #40 and Column 3, lines 28-33) provided on a side opposite the first side of the membrane, wherein the islands are spaced from each other with intervals (Fig. 2) and each of the islands includes a temperature controller for controlling heat and temperature of each probe cell independently (Column 5, lines 45-58).

Sosnowski et al teach a similar biochemical detection apparatus comprising a first membrane, a plurality of island on one side of the membrane and probe cells for immobilizing probes said probe cells being provided on the other (opposite) side of the membrane wherein the islands are spaced from each other with intervals (Column 21, lines 36-Column 22, line 30) wherein the membrane comprises a metal (e.g. silicon nitride, silicon oxide or aluminum oxide) and has a thickness of less than 5μm (Column 24, lines 23-67) wherein the silicon component provide "important properties" for the device e.g. better contact and improved sealing with circuitry and is less relative with reagents used on the surface (Column 24, line 65-Column 25, line 7).

It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the silicon components taught by Sosnowski et al to the substrate

of Astle for the expected benefits of better contact and improved sealing with circuitry and is less relative with reagents used on the surface which Sosnowski et al defines as important properties (Column 24, line 65-Column 25, line 7).

It would have been further obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the substrate of Astle to provide a membrane substrate of less than 5μm thick based on a well known thickness taught by Sosnowski et al (e.g. Column 24, lines 23-40) because one would have had a reasonable expectation of success to do so.

It is noted that *In re Aller*, 220 F.2d 454,456, 105 USPQ 233,235 states where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum by routine experimentation. Hence, it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify/adjust the membrane thickness of Astle, using routine experimentation, to obtain the instantly claimed thickness for the expected benefit of optimizing function of the device.

Double Patenting

12. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

13. Claims 1-8 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-3 of U.S. Patent No. 6,428,749. Although the conflicting claims are not identical, they are not patentably distinct from each other because both sets of claims are drawn to a biochemical reaction detection chip and differ only in the limitations of instant Claims 2-3 and 6-7 and in the arrangement of the limitations e.g. independent Claim 1 of the '749 patent recites the substrate has a heat conductivity of 10w/mk or less while instant Claim 8 which depends from Claim 5 recites this conductivity limitation. Instant Claims 2-3 and 6-7 are drawn to the length of the intervals between the islands. While the '749 claims do not recite these interval limitations, the disclosure of the specification defines their claimed islands as having intervals equal to those instantly claimed (Column 3, lines 30-31). Instant Claim 1 further differs from in that of the '749 patent in that islands are separated by intervals filled with air. However, the patent apparatus as illustrated and taught throughout the specification provides islands separated by intervals filled with air. Hence, the preferred embodiment of the patent apparatus comprises the instantly claimed intervals filled with air. For all the reasons stated above, the instantly claimed detection chip is obvious in view of the '749 detection chip, as defined by the patent disclosure (Column 3, lines 30-31).

Response to Arguments

14. Applicant argues that the instant claims differ from the patent claims because the instant claims, as amended, are drawn to "intervals filled with air". The argument has been considered but is not found persuasive. As stated above, the patent apparatus as illustrated

and taught throughout the specification provides islands separated by intervals filled with air. Hence, the preferred embodiment of the patent apparatus comprises the instantly claimed intervals filled with air.

Conclusion

15. No claim is allowed.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BJ Forman whose telephone number is (571) 272-0741. The examiner can normally be reached on 6:00 TO 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on (571) 272-0782. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BJ Forman, Ph.D.
Primary Examiner
Art Unit: 1634
May 7, 2004